Increasing Learning Motivation by Using a Smartphone: An Empirical Study in Elementary School

[1]Ivan Stevanus, [2]Edi Purwanta, [3]Suwarjo

Abstract

This study aims to provide empirical evidence about patterns of social interaction between elementary school students and the impact of gadget usage. This research is descriptive research with a survey method. The research sample was taken by purposive sampling. This study involved 475 students from four elementary schools in Yogyakarta consisting of 234-second grade students and 241 fifth grade elementary school students. Data collected, tabulated, analyzed, and conclusions. The final result shows a pattern of social interaction in the use of gadgets has two patterns, namely associative and dissociative. The contribution of this research is to determine the interaction patterns that influence the use of gadgets among elementary school students in Indonesia

Keywords: Elementary School, Empirical study, Learning motivation, Smartphone, Gadgets

I.   INTRODUCTION

The development of information and communication technology today is so fast that it has affected every aspect of human life. The wide array of forces that shape the nature of a contemporary higher education classroom ranges from globalization to technological advancements to economic and social transformations.   These trends, in turn, contribute to the diversity among students in terms of their personality, identity, and world view. Furthermore, students from varied geographic locations, religions, cultures, ethnicities, languages, educational backgrounds, socio-economic status, and work experience contribute toward a more complex classroom landscape [1]. The younger generation has grown up with electronics and technology around them and has significant exposure to digital devices [2]. In reality, technology and humans cannot be separated because the two influence each other [3]. The fast globalization causes information exchange, and the role of communication technology becomes essential for humans. Today, the use of gadgets and students are not separated, for example, mobile phones, tablets, laptops, and various other gadgets. The condition also happens to elementary students.

In the study of social interaction associated with technology, the paradigm of computers as social actors is well known [4]. Individual interactions with computers, television, and 'new media' are social and natural [5]. Many people expect the media to follow various social rules and so that their reactions and actions follow the same rules [6]. Gadgets are increasingly growing globally and have become the

[1] *Universitas Negeri Yogyakarta, Yogyakarta, 55281, Indonesia*
[2] *Universitas Negeri Yogyakarta, Yogyakarta, 55281, Indonesia*
[3] *Universitas Negeri Yogyakarta, Yogyakarta, 55281, Indonesia*

primary mediators of one's digital social life instead of personal computers [7]. Unlike desktops and laptops, gadgets can always be online and carried by users and become relatively proactive in social interactions. Smartphones are used by many people to access information and knowledge through the internet. Some people develop knowledge by accessing collections of knowledge from the Internet using their smartphones. Gadgets can be taken to improve education [8].

Fast technological developments can influence and change social interaction patterns. Students become more natural to communicate at any time without a limited time limit. This condition causes students to become lazy or reluctant to meet other students for individual needs because using a gadget has been considered practical and more efficient. This condition follows one of the characteristics of the gadget, which can be personalized to suit the abilities, knowledge, and learning styles of students individually (individuality) [9]. Students also tend not to focus when meeting and talking with friends because they are busier and focus on gadgets. Students prefer to use gadgets to communicate with other students in different classes. The presence and development of gadgets can help students in learning activities. The results show that students who use gadgets or smartphones, and their applications are more motivated to learn both in class and independently outside the classroom [10].

The gadget, like a mobile phone, can be used to do many tasks and calculations like a personal computer. Gadgets slowly replace the old mobile phone, as equipped with a powerful operating system (multitasking) along with the many useful applications and high-speed communication capabilities. Therefore, browsing the Internet or running an Internet-based application becomes more personal. Gadgets are powerful handheld computers with intrinsic cellular connections [11]. Gadgets can change the students' loneliness into a livelier atmosphere. Through gadgets, students can listen to music, play games, internet, photos, watch videos, and others, even if they are lonely in one room. If this happens, it will disturb students' social communication where they still need to engage in social interaction with other people around them, for example, to their families, peers, and friends at school. However, the gadget can also reduce actual social interaction.

Interacting with others is very necessary for elementary school students both in the school environment and residence. The use of gadgets increases among students who change their patterns of social interaction. The use of gadgets influences the way they communicate change and tends to enjoy using gadgets primarily to help and facilitate their activities in games and learning. The use of gadgets reduces the intensity of students' relationships with others [12]. The use of gadgets is due to the demands of the current trends that require students to interact and communicate via the internet or social media actively. However, children who often use gadgets often forget their environment. Children prefer to play using gadgets rather than playing together with friends in the surrounding environment. Gadget usage reduces social interaction between children. The environment is reduced, and even fades [13].

This phenomenon seems to be a concern that must be felt together. Stretching the virtual world today is more loved by elementary students than interacting with people around them. Research and Development Agency MCIT Indonesia-UNICEF shows that at least 30 million children and adolescents in Indonesia are internet users, and digital media is currently the primary choice of communication channels. This study showed that 69% of respondents used computers to access the internet. About one-third of them (34%) used laptops, and a small percentage (only 2%) were connected through video games. More than half of the respondents (52%) used gadgets to access the internet, but less than a quarter (21%) for smartphones and only 4% for tablets [14].

The learning skills in the 21st century encourage students to learn through multimedia, improve writing skills, deep learning, and integrate technology into learning [15]. Therefore, the real conditions of the 21st century will be a challenge or even a separate threat for elementary school teachers because teachers who come from the pre-digital world will be overwhelmed by students in the digital age. The fact that the teacher encounters difficulties in preparing students to build effective communication and social interaction because students' habits and ways of learning are often different. This fact often makes both parties, students on one side, and teachers, on the other hand, have the potential to find no common ground in learning in class, although the teacher has integrated the values of learning in different ways [16].

Gadgets can change the students' loneliness into a livelier atmosphere. Through gadgets, students can listen to music, play games, internet, photos, watch videos, and others, even if they are lonely in one room. Gadgets can always be online and brought together by users, *and* gadget users are relatively proactive in social interaction [4]. The gadget was initially used as a communication tool, its function as an entertainment tool, to make someone anti-social [17]. Elementary students in their lives need to engage in social interaction around them, both to their families, peers, and friends at school.

Gadgets are an essential item for people's digital social life. The user's emotional attachment to the gadget will close the ability to connect with the surrounding environment [18]. Social disposition is defined into three factors, namely chronic loneliness, attachment style, and cultural orientation [19]. Chronic loneliness refers to long-term intermittent feelings that are separated from the surrounding social environment. People with Chronic loneliness may not be addicted to gadget users and tend not to do anthropomorphic to gadgets if the gadget is only considered a tool [20]. Researchers have found that people change attachment styles when switching to a new relationship [21]. Today's efforts to balance personal life with a phone (gadget) show that human relations among them can be close.

Communication using gadgets certainly changes the rules that existed before and can make the quality and quantity of face-to-face communication decrease. Students in daily life cannot be separated from gadgets and form a collaboration pattern in cyberspace. Gadgets can cause emotional attachment to users [18]. He argues that the existence of social investment or social practices around the use of gadgets gives impetus to stimuli and results in an intense emotional attachment to someone. Students can use gadgets as communication tools in communicating without time limits because even in the middle of the night, students can communicate with other people. The existence of gadgets can be a new interaction pattern in the school environment in dealing with other students. Students prefer to use gadgets because they are considered more practical, efficient, shorten the distance and speed up time and facilitate students. They do not have to bother coming to the place where someone is intended.

Social interaction describes a dynamic social relationship that involves relationships among individuals, society groups, and between individuals and social groups. Social interaction between social groups occurs between groups as a whole and usually does not involve the personal members. Social interaction here begins when two people or more communication with each other using a gadget. Students can do activities to admonish each other, exchange information, do assignments, and chat with each other. Those activities can be called as a form of social interaction. The social interaction using the gadget reviewed by this study also contains various kinds of student relation to interacting withing each other. Gadget, like a smartphone, is criticized as "psychological poisons," which reduce the quality of interpersonal skills and encourage people not to humanize fellow humans [22].

Social interaction through computers is automatic and comes from the innate need for simplicity and predictability [6]. The variants in innate needs may not be well investigated, and the motivation behind the actor's social attribution and social interaction has not been well explained. It can be meant that social psychological dispositions show trends in social behavior and expand responses to social cues. Social interactions that occurred through the media make the bounding of the community's social solidarity weak [23]. Meeting face to face is no longer a standard or a basis for communication comparison. Children do not interact too much with others but prefer to use their media themselves [24]. children who are familiar with gadget technology also affect the development and education of early childhood. Based on or not, the environmental habits of early childhood will shape the development of children and make children less sociable with the surrounding environment.

The use of gadgets, like smartphones, in the learning process, especially in the classroom, is challenging. This condition offers the benefits of various content delivery, knowledge sharing, and dynamic learning activities where students can expect to experience multiple channels of interaction in learning [25]. The students will come to meet the friend if the message delivered through the gadget is not delivered or not sent. This pattern shows that the gadget has been used as a new way of social interaction, especially for active gadget users to meet and interact with their friends. This condition shows that social interaction in cyberspace using gadgets is favored by many people and has changed the way of communication.

In a classroom learning activity, teachers can integrate technology, such as gadgets, into their learning methods [26]. Strong focus on the use of technology in learning can lead to more substantial involvement by students and teachers [27]. However, gadgets are perceived to disturb students learning in the classroom [28]. Gadgets can be a capital for teachers in developing their creativity in teaching. The most appropriate teaching pattern for students in the digital age is to invite them to learn in the digital world. Gadgets become easy things to use in learning. teachers should not run away from the technology-filled world of students if they want to be heard and cared for. the teacher must enter the world of students so that they can guide students to use gadgets wisely

Elementary students in Indonesia faced problems in the use of gadgets and tend to be less focus on interacting with their friends so that gadget affects the social interaction pattern of elementary students. The development of gadgets can help students in learning activities, but, on the one hand, can reduce the pattern of actual social interaction. This research is vital to be done to find out the pattern of social interaction among elementary school students. The research is expected to be able to provide empirical evidence about patterns of social interaction between elementary school students and the impact of gadget usage.

II.   MATERIAL AND METHOD

This research is descriptive research with a survey method. The research sample was taken by purposive sampling. This study involved 475 students from four elementary schools in Yogyakarta. The sample consisted of 234 second grade students and 241 fifth grade students of elementary schools—data obtained by documentation, observation, and interviews. Interviews were conducted randomly based on the academic achievements of students in second and fifth grade. a selection of second grade on the grounds class representing low class and fifth grade representing the high class. Second and fifth grade can develop social skills among peers.

In-depth interviews are conducted; this is done to get involved with the life of the informant or sample. This study was conducted in four elementary schools in Yogyakarta, consisting of public and private schools. Data analysis uses descriptive analysis, which is data collected, tabulation, analysis, and provides conclusions. Data is collected, grouped according to variables and types of respondents, tabulation of data is based on variables from all respondents, presents data for each variable studied, analyses, and draws conclusions based on research results.

III. RESULTS

The Age of the Child is Familiar with Gadgets

The survey results for elementary school students show that children have been introduced to gadgets from an early age. People who play a role in the introduction of gadgets are parents and family (uncles, aunts, grandmothers, grandfathers). The survey results show two patterns of interaction, namely associative and dissociative. Survey results can be seen in table 1.

Table 1. Introduction of Gadgets in Children

o.	Item		Information	Frequency	Percentage (%)
Age	Gadget Usage		toddler	95	20
			Kindergarten (nursery school)	95	20
			Elementary School	285	60
	Gadget Introduced By		Parents	380	80
			Family	95	20

Since the age of five, students have learned about gadgets with a percentage of 20% (95 children), kindergarten age 20% (95 children), and 60% (285 children) at elementary school age. The gadget is very familiar to students in second and fifth grade in elementary school. Children are first introduced to gadgets by parents and family. Parents play a huge role with a percentage of 81% (385 children) and the rest by the family, such as brother, uncle, aunt, grandfather, and grandmother, by 19% (90 children). The gadget has been introduced early on to children in the community. The rapid development of gadgets affects the patterns of social interaction of children. The results of the study produced two patterns of social interaction, namely associative and dissociative. Associative patterns include cooperation and accommodation, while Dissociative patterns include conflicts between students.

The Associative Pattern in The Form of Cooperation and Accommodation

The results of the associative pattern are the formation of friendships through WhatsApps (WA) groups, gadgets for sharing information, doing homework, entering into collective agreements, utilizing games and the internet in gadgets, length of time playing gadgets, gadgets as friends. The results of the associative pattern can be seen in table 2.

Table 2. Student Associative patterns in utilizing gadgets

o	Item	Information	Frequency	Percentage (%)
	Friends of the WhatsApp group	There is	428	90
		There is no	47	10
	Share information with gadgets	Sharing information	404	85
		No.	71	15
	Doing homework	Do homework	452	95
		There is no	23	5
	Make a joint agreement	Studying, sports, traveling together	437	92
		There is no	38	8
	The use of games and the internet in gadgets	With friends	53	11
		Home alone	422	89
	Long time playing gadget	More than 1 hour	304	64
		Less than 1 hour	171	36
	A gadget as a friend	As a friend in solitude	437	92
		There is no	38	8

Collaborations carried out by elementary students are by forming a WA group. Most students had friends in the WA group, especially children in the 5th class (90%). Using gadgets, they often shared information (85%), did assignments or homework (95%), made an appointment to meet, such as learning together, having sports, and taking a walk together (92%). Besides, that elementary school students knew gadgets and felt interested because they could play games and internet with friends by 11%, and 89% of students played gadgets themselves at home. In a day, the child could spend time playing gadgets for more than one hour by 64% and the remaining 36% less than 1 (one) hour. The survey results showed that most elementary school children (92%) considered that a gadget could be a friend in loneliness when friends were not around.

Accommodation aimed to alleviate opposition between students with different understandings and goals. This condition occurred mostly in the fifth grade. Accommodation used was that students had enthusiasm and motivation to solve problems if disputes occurred in school. Students usually solved directly through communication in the gadget, considering that the fifth-grade children had made an alley group. Thus, this almost happened among the members of the gang. When the problem was not resolved, students would invite to meet directly other students involved in the problem. However, if the problem continued, they would bring the problem to the classroom teacher.

Student social interaction with gadgets has two forms, namely associative patterns and disassociative patterns. Associative patterns include cooperation and accommodation. Collaboration carried out by students is to form a WA group. Students aim to share information, do homework, make an appointment to meet through the WA group in their gadgets. Accommodation aims to alleviate opposition

between the two parties who have different understandings and objectives. Accommodation is that students have the enthusiasm to solve problems happening at their school. They usually solve directly with excellent communication through using the gadget, but if it is not solved, then they will directly meet others involved in the problem. While the disassociative process is a conflict or dispute in which individuals or groups try to fulfill their goals by opposing them against parties using threats or violence. Conflict in students' social interactions using gadgets is sporadic. Only misunderstandings often result in friction between students because interacting using WA or other social media has many informal languages that sometimes make misunderstandings be-tween the sender and the recipient of the message.

Dissociative patterns in the form of conflicts

Conflict or conflict is a social process in which individuals or groups try to fulfill their goals by opposing the opposing party with threats or violence. Conflicts in the social interaction of elementary school students who use gadgets are infrequent, what happens is only a misunderstanding that results in friction between students, such as when children play games and the internet. Besides that, in communicating using WA or other social media, many informal languages sometimes make misunderstandings between the sender and recipient of the message. Conflicts that arise precisely are personal because they are upset and angry when playing games. However, through accommodations mediated by teachers, conflicts through gadgets are rare among elementary students.

Conflict or dispute was a social process in which individuals or groups tried to fulfill their goals by opposing them against parties using threats or violence. Conflict in students' social interactions using gadgets was sporadic. Only misunderstandings often resulted in friction between students because inter-acting using WA or other social media had many informal languages that sometimes-made misunderstandings between the sender and the recipient of the message. The conflicts happened because of personal conflicts due to anger when playing games. However, through accommodation mediated by teachers, conflicts through gadgets were rare among elementary school students.

The forms of social interaction of students on using gadgets such as collab-oration by elementary students are like sharing information, making agreements, doing assignments, or homework. Besides, conflicts that occur among students are rare, with only differences of opinion and misunderstandings. This difference usually occurs in groups, and for example, there are different opinions in communicating through gadgets such as in doing assignments and playing games. However, if there is accommodation from the students, they will solve the problem directly through communication. If the problem cannot be resolved, the student will invite to meet students who are involved in the problem or by requesting a problem to the classroom teacher if the problem continues. Social and emotional experience accompanied by interactions with other children and those around them is the initial experience of a child's life in obtaining future academic and personal results, as well as creating other developments [29]. When children develop social and emotional skills, they gain the confidence and competencies needed to build relationships, solve problems, and overcome emotions [30].

The use of gadgets, however, has a positive and negative impact, depends on how students interpret the use of the gadget. The role of parents at home and teachers in school is expected to help students limit themselves in using a gadget. The positive and negative impacts are as follows: Positive Impact: 1) it is easy to interact with friends through social media. 2) it is used to shorten distance and time. In the era of sophisticated gadgets, long-distance relationships are no longer a problem and become obstacles. (3) it is easier for students to consult lessons and tasks that they do not understand. These

impacts are a form of accommodation pattern where if there is a problem of a lesson, students can complete using a gadget. Gadgets can be used to study subjects such as English and Mathematics. This is usually done by students to communicate through the WA group among their classmates. (4) it is used to know the information about the activities held at school, and students will share information about activities, photos related to activities in school and then share it in groups or can also directly distribute to certain people. Gadgets can also provide information about the latest games and videos on Youtube.

Besides having a positive impact, the gadget also has negative impacts, including: (1) Gadgets that have a variety of applications will make students prefer to stay lone than playing with friends. (2) Students who have used social media on their gadgets use more of their time to communicate on social media than learning. (3) Students feel attached to the gadget, so when there is a prohibition on the use of gadgets by parents and teachers, they feel sad and angry. (4) Students can be influenced by harmful content derived from videos on Youtube, both violent and pornographic content.

The presence of gadgets also makes changes in student behavior, where students are gathered or clustered to just talk about something. They will focus more on gadgets than with people who are nearby. It is fun when walking while playing a gadget. Students just look down at the gadget regardless of the surrounding environment. gadgets become friends of a child, so the act of greeting, joking with friends becomes less [31]. In this case, the pattern of conflict almost does not occur because the intensity of students to interact socially is low, and conflicts happen more in personal conflicts due to anger when playing games.

The final results show that the pattern of social interaction in the use of gadgets by elementary school children has two patterns. Interaction patterns that are formed are associative and disassociative. Associative social interaction patterns can be seen when many students work together to do group work, homework, and exchange information. However, students also tend not to focus on interacting with their friends because they are busier playing games on their gadgets. Disassociative patterns are seen when students can resolve conflicts that occur due to differences in ideas and opinions and misunderstandings.

The originality or value of this study is the use of gadgets among high school students. Therefore, identifying patterns of interaction among elementary school students that can contribute to the use of gadgets is very important. The contribution of this research is to determine the interaction patterns that influence the use of gadgets among elementary school students in Indonesia.

References

[1] A. Kaur, R. Awang-Hashim, and M. Noman, "Defining Intercultural Education for Social Cohesion in Malaysian Context," *Int. J. Multicult. Educ.*, vol. 19, no. 2, pp. 44–60, 2017.

[2] Y. S. Wang, M. C. Wu, and H. Y. Wang, "Investigating the Determinants and Age and Gender Differences in The Acceptance of Mobile Learning," *Br. J. Educ. Technol.*, vol. 40, no. 1, pp. 92–118, Jan. 2009.

[3] A. D. Tatnall, "Using Actor-Network Theory to Understand the Process of Information Systems Curriculum Innovation," *Educ. Inf. Technol.*, vol. 15, no. 4, pp. 239–254, 2010.

[4] W. Wang, "Smartphones as Social Actors? Social dispositional factors in assessing anthropomorphism," *Comput. Human Behav.*, vol. 68, pp. 334–344, Mar. 2017.

[5] C. Nass, Y. Moon, B. J. Fogg, B. Reeves, and C. Dryer, "Can Computer Personalities Be Human Personalities?," in *Conference on Human Factors in Computing Systems - Proceedings*, 1995, vol.

2, pp. 228–229.

[6]   C. D. Martin, "The Media Equation: How People Treat Computers, Television and New Media Like Real People and Places [Book Review]," *IEEE Spectr.*, vol. 34, no. 3, pp. 9–10, Apr. 2005.

[7]   J. Heggestuen, "One In Every 5 People In The World Own A Smartphone, One In Every 17 Own A Tablet [CHART] | Business Insider," *Business Insider*, 2013. [Online]. Available: https://www.businessinsider.com.au/smartphone-and-tablet-penetration-2013-10. [Accessed: 17-Apr-2020].

[8]   M. N. Almunawar, M. Anshari, H. Susanto, and C. K. Chen, "Revealing Customer Behavior on Smartphones," *Int. J. Asian Bus. Inf. Manag.*, vol. 6, no. 2, pp. 33–49, Apr. 2015.

[9]   Y. Mehdipour and H. Zerehkafi, "Mobile Learning for Education: Benefits and Challenges," *Int. J. Comput.*, vol. 3, no. 6, pp. 251–259, 2013.

[10] A. Balula, F. Marques, and C. Martins, "BET on Top Hat - Challenges to improve language proficiency," in *7th International Conference on Education and New Learning Technologies*, 2015, pp. 2627–2633.

[11] Z. Davies, "Definition of smartphone | PCMag," *PCMAG*, 2015. [Online]. Available: https://www.pcmag.com/encyclopedia/term/smartphone. [Accessed: 17-Apr-2020].

[12] D. Harfiyanto, C. B. Utomo, and T. Budi, "Pola Interaksi Sosial Siswa Pengguna Gadget di SMA N 1 Semarang," *JESS (Journal Educ. Soc. Stud.*, vol. 4, no. 1, 2015.

[13] B. Manumpil, A. Ismanto, and F. Onibala, "Hubungan Penggunaan Gadget dengan Tingkat Prestasi Siswa di SMA Negeri 9 Manado," *J. Keperawatan UNSRAT*, vol. 3, no. 2, p. undefined-undefined, 2015.

[14] G. Gayatri, U. Rusadi, S. Meiningsih, D. Mahmudah, D. Sari, and A. C. Nugroho, "Digital Citizenship Safety Among Children And Adolescents in Indonesia DIGITAL CITIZENSHIP SAFETY AMONG CHILDREN AND ADOLESCENTS IN INDONESIA PERLINDUNGAN PENGGUNA MEDIA DIGITAL DI KALANGAN ANAK DAN REMAJA DI INDONESIA," *J. Penelit. dan Pengemb. Komun. dan Inform.*, 2015.

[15] L. Schrum and B. B. Levin, "Educational technologies and twenty-first century leadership for learning," *Int. J. Leadersh. Educ.*, vol. 19, no. 1, pp. 17–39, Jan. 2016.

[16] Suyatno, Jumintono, D. I. Pambudi, A. Mardati, and Wantini, "Strategy of Values Education in the Indonesian Education System," *Int. J. Instr.*, vol. 12, no. 1, pp. 607–624, Jan. 2019.

[17] R. Ling, *New Tech, New Ties: How Mobile Communication Is Reshaping Social Cohesion*. MIT Press, 2008.

[18] J. Vincent, "Emotional Attachment and Mobile Phones," *Knowledge, Technol. Policy*, vol. 19, no. 1, pp. 39–44, Mar. 2006.

[19] N. Epley, A. Waytz, and J. T. Cacioppo, "On Seeing Human: A Three-Factor Theory of Anthropomorphism," *Psychol. Rev.*, vol. 114, no. 4, pp. 864–886, Oct. 2007.

[20] M. Bian and L. Leung, "Linking Loneliness, Shyness, Smartphone Addiction Symptoms, and Patterns of Smartphone Use to Social Capital," *Soc. Sci. Comput. Rev.*, vol. 33, no. 1, pp. 61–79, Feb. 2015.

[21] L. A. Kirkpatrick and C. Hazan, "Attachment Styles and Close Relationships: A Four-Year Prospective Study," *Pers. Relatsh.*, vol. 1, no. 2, pp. 123–142, 1994.

[22] K. Ablow, "iPhone's Siri: Psychological Poison?," *Fox News*, 27-Mar-2015. [Online].

Available: https://www.foxnews.com/health/iphones-siri-psychological-poison. [Accessed: 17-Apr-2020].

[23] S. Ameliola and H. D. Nugraha, "Perkembangan Media Informasi dan Teknologi Terhadap Anak dalam Era Globalisasi," *Pros. 5th Int. Conf. Indones. Stud. "Ethnicity Glob.*, pp. 362–371, 2013.

[24] S. Littlejohn and K. Foss, *Encyclopedia of Communication Theory*. SAGE Publications, Inc., 2012.

[25] A. Buchholz, B. Perry, L. B. Weiss, and D. Cooley, "Smartphone Use and Perceptions among Medical Students and Practicing Physicians," *J. Mob. Technol. Med.*, vol. 5, no. 1, pp. 27–32, Mar. 2016.

[26] M. Anshari, M. N. Almunawar, M. Shahrill, D. K. Wicaksono, and M. Huda, "Smartphones usage in the classrooms: Learning aid or interference?," *Educ. Inf. Technol.*, vol. 22, no. 6, pp. 3063–3079, Nov. 2017.

[27] T. Adam and A. Tatnall, "The value of using ICT in the education of school students with learning difficulties," *Educ. Inf. Technol.*, vol. 22, no. 6, pp. 2711–2726, Nov. 2017.

[28] A. J. Williams and H. E. Pence, "Smart Phones, A Powerful Tool in The Chemistry Classroom," *J. Chem. Educ.*, vol. 88, no. 6, pp. 683–686, Jun. 2011.

[29] S. A. Denham, "Social-Emotional Competence as Support for School Readiness: What Is It and How Do We Assess It?," *Early Educ. Dev.*, vol. 17, no. 1, pp. 57–89, 2006.

[30] R. Parlakian, *Before the ABCs: Promoting School Readiness in Infants and Toddlers*. Zero to Three, 2003.

[31] J. Newman, "To Siri, With LLove," *The New York Times*, 2014. [Online]. Available: https://www.nytimes.com/2014/10/19/fashion/how-apples-siri-became-one-autistic-boys-bff.html. [Accessed: 17-Apr-2020].